

Application of Moat & Row as a Dust Control Measure on Owens Dry Lake

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Outline

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Background

Background

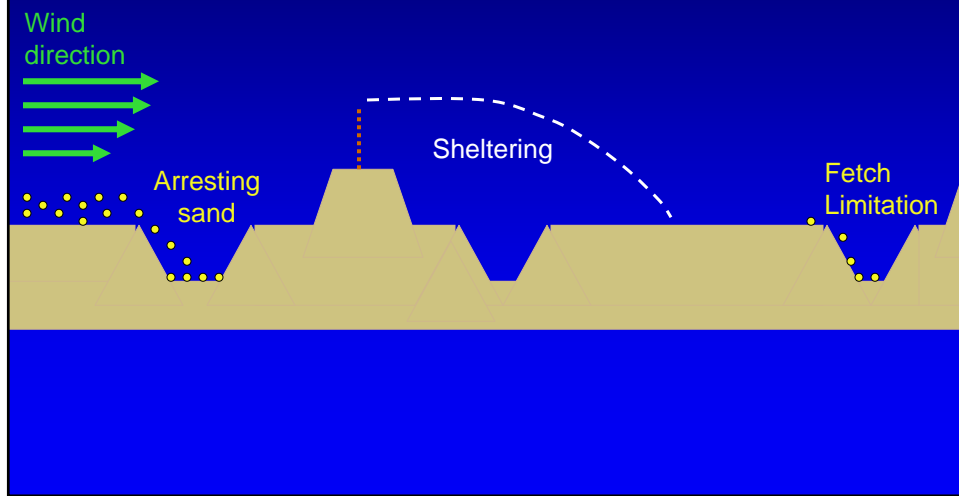
- Los Angeles Department of Water and Power (LADWP) planning to build up to 3.5 square miles of Moat and Row (M&R) on the Owens playa.
- Two M&R pilot tests were operated from October 2007 to July 2008.

M&R Principle

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- M&R and other barriers act to reduce sand motion and dust emissions by:
 - Arresting and storing sand moving in from upwind direction
 - Sheltering the surface
 - Limiting the distance over which sand motion can develop (fetch)

M&R Principle

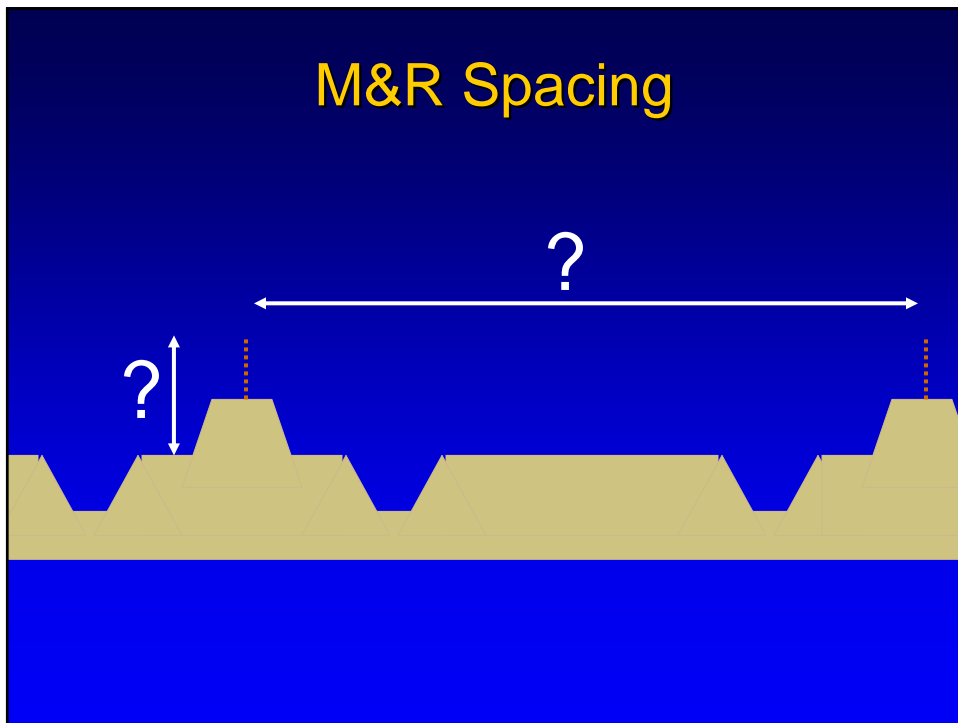


Design Considerations

Design Considerations

- Depending on design, M&R can be tailored to the predominant wind direction(s).
- Height and porosity of rows.
- Spacing of rows.

M&R Spacing



SWEEP Modeling

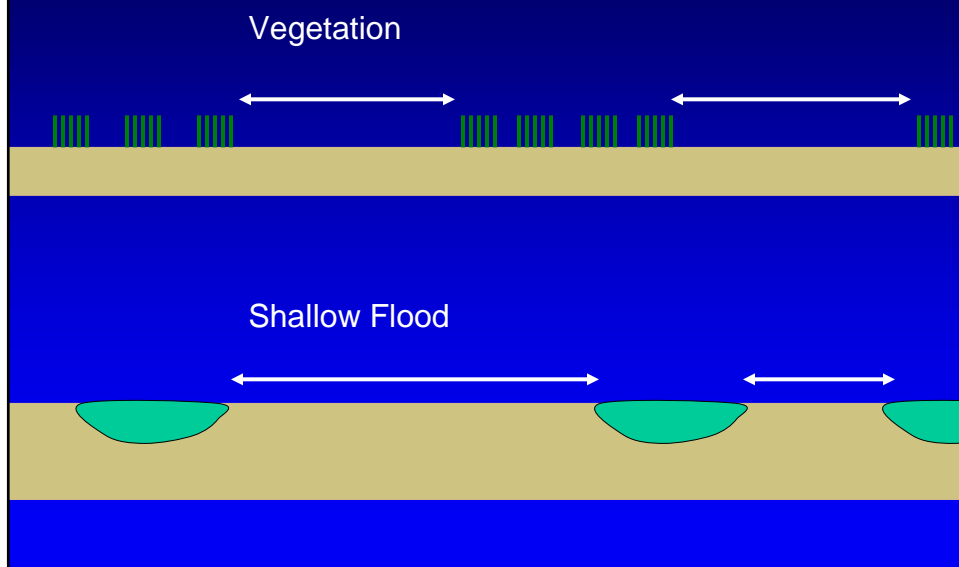
- Basis for design M&R spacing:
Single-event Wind Erosion Evaluation Program.
- Wind erosion model based on the Wind Erosion Prediction System (WEPS)
- Developed and maintained by Natural Resources Conservation Service (NRCS).

SWEEP Modeling

- Simulates 24-hour wind erosion potential with site specific input:
 - Wind speed and direction
 - Soil and surface characteristics
 - Vegetation
 - Wind barriers
- Applied to calculate saltation flux and control efficiency as a function of distance (fetch length).

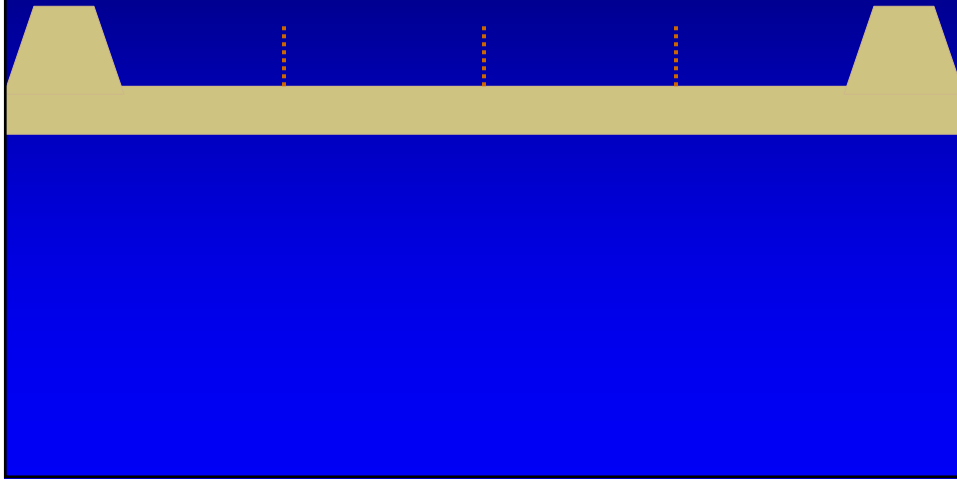
SWEEP Modeling Options

Types of Dust Control Measures

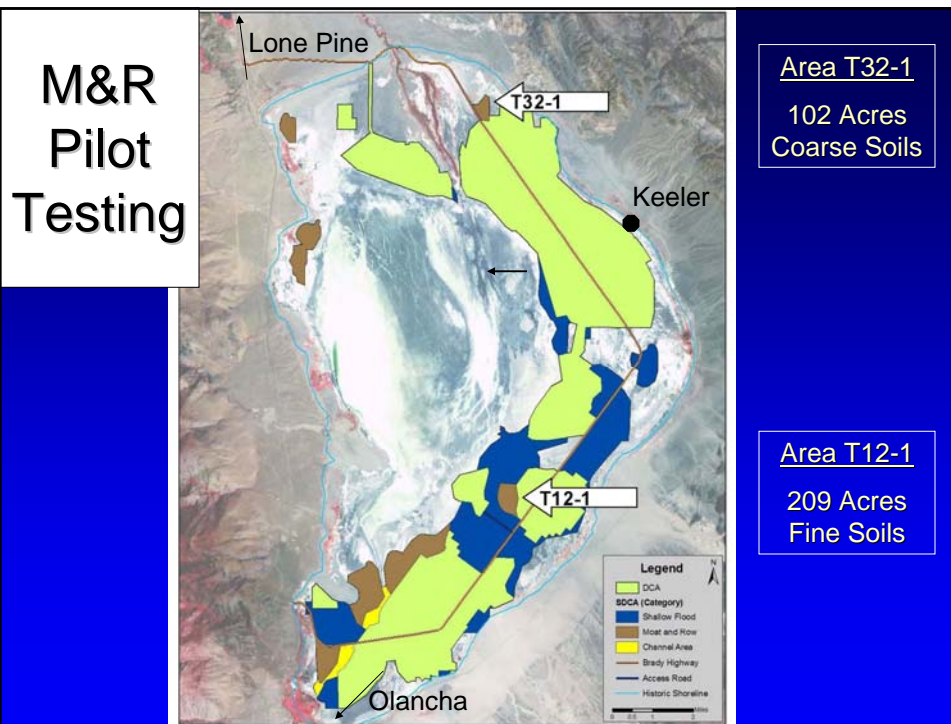


Types of Dust Control Measures

Arrays of Barrier Types

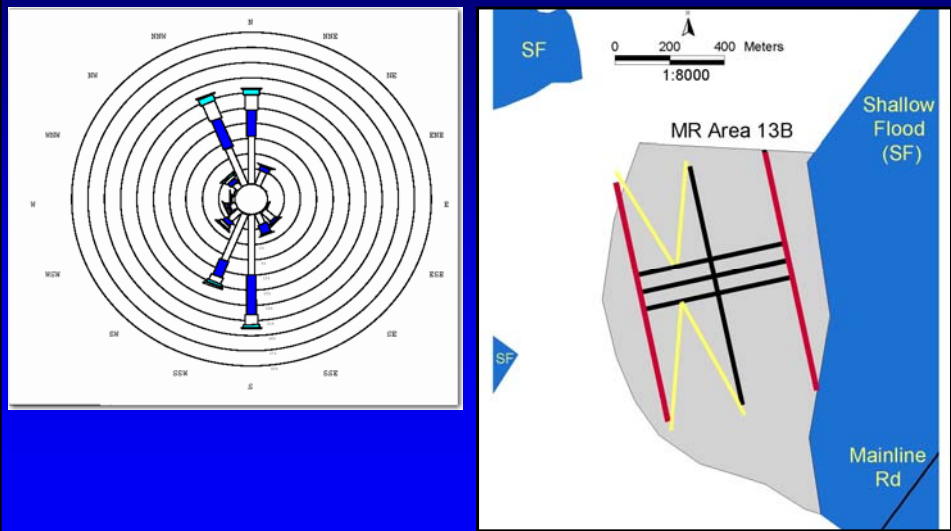


Pilot Testing of M&R at
Owens Lake

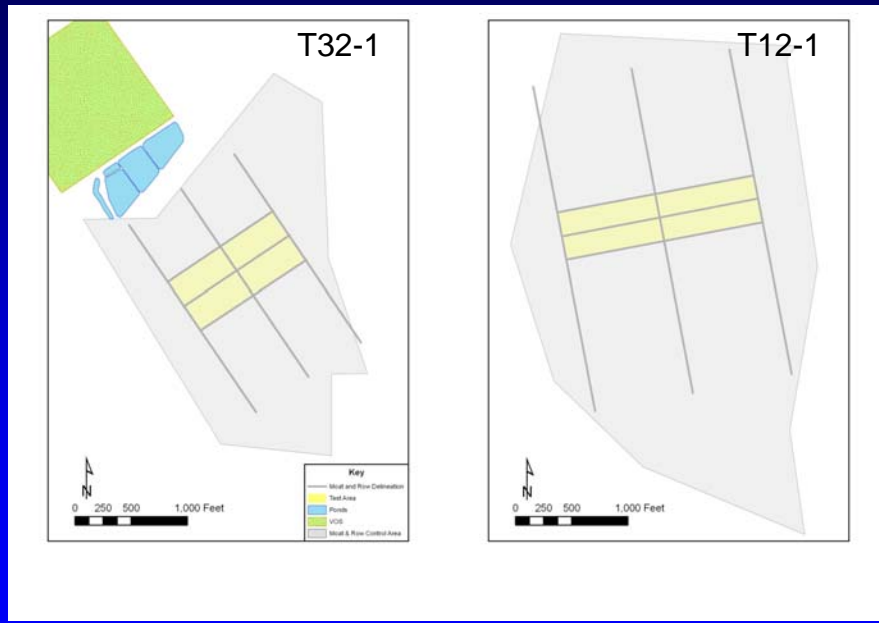


Wind Direction

Area T12-1: 348 degrees azimuth



Design Concept



T12-1: Row Detail



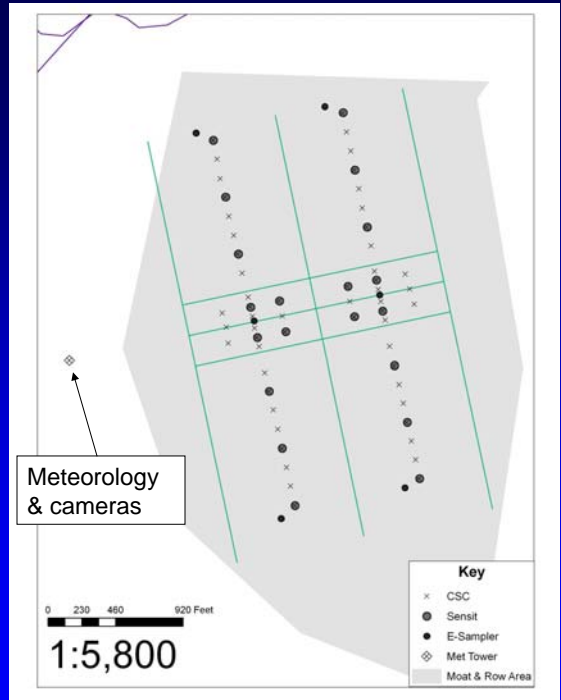
T12-1: Interior Area



T12-1: Open Area

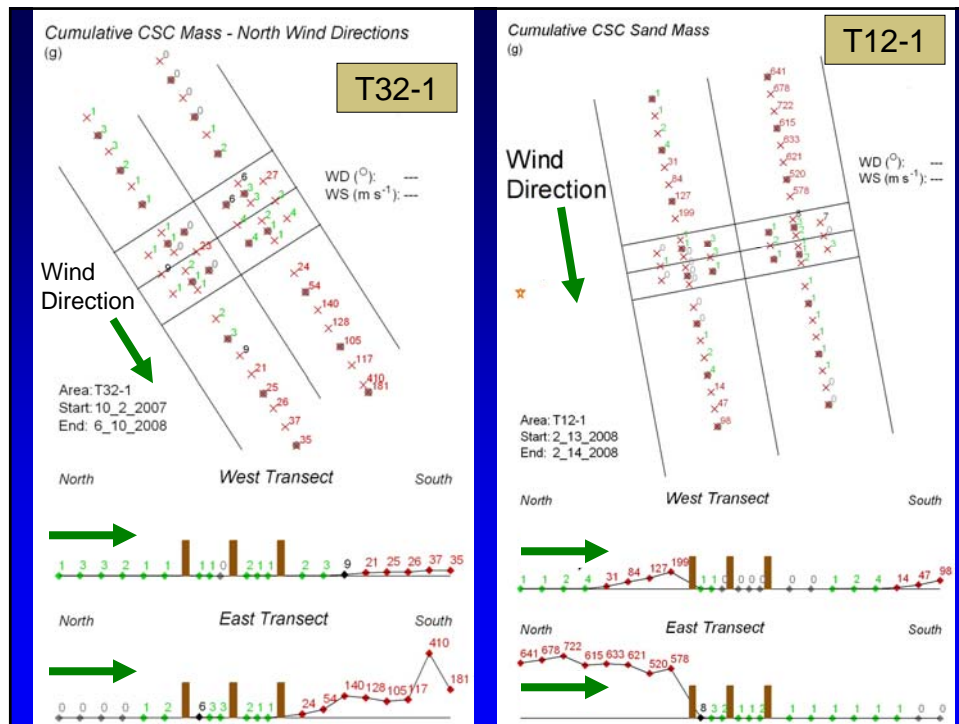


Monitoring Area T12-1



Results

- 10 months of data (October 2007 to July 2008)
- Lake bed quite emissive throughout 2007-2008 dust season, including open portions of the M&R pilot test areas.



T12-1: Open Area- August 2007



T12-1: Open Area- Post storm



T12-1: Interior Area- Post storm



Summary

Summary

- Pilot studies demonstrated that M&R is effective in controlling sand motion on Owens Lake.
- The SWEEP model valuable as design and evaluation tool.